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Introduction to Epidemiology - Course Syllabus 2011-2012

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Introduction to Epidemiology Fall 2011

Instructor: Lauren Arnold, PhD, MPH

Office: Kingshighway 5031

Phone: 454-8123

Email: arnoldl@wudosis.wustl.edu

Course Meetings: T, Th 9am-12pm

Course Location: Kingshighway 7th Floor Conference Room

Office Hours: By arrangement

TA: Lusine Yaghjian, MD, PhD

Office: Kingshighway 7312

Phone: 747-4474

Email: yaghjianl@wudosis.wustl.edu

Office hours: Th, 12-1pm

Course Description: This course introduces the basic principles and methods of epidemiology, with an emphasis on critical thinking, analytic skills, and application to clinical practice and research. Topics include outcome measures, methods of adjustment, surveillance, quantitative study designs, and sources of data. Designed for those with a clinical background, the course will provide tools for critically evaluating the literature and skills to practice evidence-based medicine.

Course Evaluation: Midterm and final exams, class participation, problem sets, and papers.

Course Objectives:

To become familiar with epidemiologic terminology, outcome measures, and study designs; to appreciate application of epidemiology to subfields (e.g., infectious diseases, reproductive health, genetics); and to apply epidemiologic methods to current public health issues.

Competencies (Intro & Intermediate Epidemiology):

1. Understand the criteria commonly used to evaluate causal relationships.
2. Evaluate the quality and comparability of data.
3. Understand the major study designs for obtaining quantitative information relevant to population health research questions from surveillance, observational, community-based and controlled trial research studies and be able to select the most appropriate design for different hypotheses.
4. Define exposure variables, outcome variables, extraneous variables and measures of their frequency.
5. Understand and calculate commonly used health measures, such as relative risk, attributable risk, and odds ratio; select appropriate methods for estimating such measures.
6. Define appropriate comparison groups for epidemiologic studies.
7. Interpret descriptive and inferential statistics resulting from data analysis and draw relevant conclusions.
8. Apply the concepts of confounding and bias to describe variables; describe appropriate methods for addressing each.
9. Critique the study design and quantitative methods used in published literature and appropriately interpret the findings.
10. Identify key sources of epidemiologic data.
11. Describe a public health problem in terms of magnitude, person, time and place.
12. Formulate and apply epidemiologic methodology to identify a specific public health problem, develop a hypothesis, and design a study to investigate the issue.

REQUIRED TEXT

Gordis L. *Epidemiology*, 4th Ed. 2008. Philadelphia, PA: Saunders-Elsevier. ISBN: 978-1-4160-4002-6.

*Required articles on page 5.

ROLE OF INSTRUCTOR AND STUDENTS

Course Expectations: The instructor will prepare and deliver course material; be available to students during office hours, after class, and by appointment; and provide timely and clearly explained feedback on student performance. The instructor expects students to attend each class on time; complete all assignments in a timely manner; come to class prepared, having read all assignments; participate in class discussions; seek any necessary clarification regarding course expectations; and provide feedback about the effectiveness of the course. **Any issues with attendance, meeting deadlines, or completing assignments should be discussed promptly with the instructor.** E-mail is the best way to contact me.

Academic Honesty:

Students are expected to complete exams and assignments in accordance with Washington University's academic rules and regulations regarding honesty and integrity. Any evidence of academic misconduct, including **cheating, failure to cite sources, and plagiarism** will result in appropriate action as dictated by Washington University. Violations of academic honesty will result in notification to the Associate Dean of Academic Affairs at the Washington University School of Medicine, as well as to the MPHS Director and Program Committee. Any hint of violation during exams/assignments will result in no grade for the exam/assignment. For more information, see the University's Student Academic Integrity Policy: www.wustl.edu/policies/undergraduate-academic-integrity.html

Special Needs: Per University policy, students with a learning, sensory, or physical disability or other impairment, should contact the **Washington University Center for Advanced Learning Disability Resources (DR)** at 935-4062 (tel) or visit <http://disability.wustl.edu/DisabilityResources.aspx>. The DR office is located in Cornerstone on the Danforth Campus. Students whose second language is English and/or those in need of assistance in lectures, reading or writing assignments, and/or testing, should contact the University Writing Center at 935-4981 or visit <http://artsci.wustl.edu/~writing/home.html>.

BLACKBOARD

We will use Blackboard to manage our class, access assignment instructions and problem sets, and post course-related questions. Blackboard can be accessed at <https://bb.wustl.edu/>. Log in with your WUSTL Key, and Intro Epi should appear on the homepage. Lecture notes will be posted on Blackboard, generally the evening before class. Guest lecturers will post materials at their discretion. Problem sets, answer keys, and assignment instructions will be posted on Blackboard throughout the semester.

We will utilize the Discussion threads for general questions related to lecture and assignments. Students should post all general questions that may be relevant to others in class to the Discussion thread. The instructor and TA will monitor questions once a day (with the exception of weekends) and post answers. Every effort will be made to answer student emails within 24-hours (excluding weekends). Student-specific questions (e.g. related to a grade or exam conflict) should be emailed directly to the instructor. *Students are encouraged to post materials related to class (e.g. link to a news story) on Blackboard for the rest of the class to access.*

ASSIGNMENTS & GRADING CRITERIA

Assignments: Unless otherwise noted, **assignments are due at the beginning of class on the due date.** Course grades are based on:

1. *Participation (10%):* The participation portion of your grade is based upon regular and timely attendance, as well as active, meaningful contributions to class discussion and in-class exercises.
2. *Problem Sets (10%):* Four problem sets (15 points each) to practice calculations will be assigned. Problem sets will be available on Blackboard, and answer keys will be posted after each due date.
 - Problem Set #1: Rates – due 9/1/11
 - Problem Set #2: Standardization – due 9/13/11
 - Problem Set #3: 2x2 Tables – due 9/27/11
 - Problem Set #4: Screening – due 10/13/11
3. *Article Critique (15%):* For this assignment, you will critique one peer-reviewed journal article from a list provided. Additional details will be posted on Blackboard. **Due date: 10/6/11.**
4. *Quizzes (20% each):* There will be two short (1 hr) quizzes during the semester. The first quiz is on **September 15** and includes lectures 1-5. The second quiz is on **October 4** and includes lectures 6-10. Information from lectures, the text, and supplemental readings is fair game.
5. *Presentation (25%)* – Each student will select a topic of interest and do a 30-minute PowerPoint presentation that includes an overview of the epidemiology of the topic, as well as discussion of two articles with conflicting findings related to the topic. Discussion should focus on understanding and interpreting the conflicting findings in light of epidemiologic methods employed (e.g. study design, sampling, data collection, analysis). Students will provide the two citations to the professor one week prior to the presentation for distribution to the rest of the class. Articles must be accessible online via Becker Library or as open-access articles. **Due dates: Oct 18 and Oct 20**

Grading Scale:

A	94-100	B+	88-89	B-	80-83	C	73-77	F	≤69
A-	90-93	B	84-87	C+	78-79	C-	70-73		

Policy on Late Assignments: Due to the condensed nature of class, **late problem sets will not be accepted for credit.** Students who are unable to attend class must make arrangements with the professor to turn the problem set in early. All other late assignments will result in a deduction of five percentage points for each day late (including weekends) unless prior approval is obtained from the professor or a compelling situation prevents prior approval. The professor will allow for (documented) family emergencies (e.g. birth/death in the family). Health issues must be documented by a physician.

Expectations for Written Work: All written assignments must be **double-spaced, typed in Times New Roman or Arial 11- or 12-point font with 1-inch margins.** Ideas, information, and concepts that originated with any other source must be cited correctly. **Material that is not correctly cited is considered plagiarism and provides grounds for academic discipline** (see “Academic Honesty,” p.2).

Grade Challenges: Students have **1 week** from the day an assignment/exam is returned to the class to challenge a grade. Under no circumstances will a grade be adjusted beyond this time. During a grade challenge, the professor reserves the right to review the entire assignment/exam and add or deduct points as appropriate.

Introduction to Epidemiology Fall 2011

Class	Date	Topic	Readings (PRIOR to class)*	Assignments Due
Class 1	Aug. 30	Measuring Disease Occurrence	Gordis: Ch.1, Ch.3 (to p.54), Ch.4 (to p.74) Article: Zhang	
Class 2	Sept. 1	Surveillance Guest: Margie Olsen, PhD	Gordis: Ch. 3 (pp.54-56) Articles: Panozza; Bueno	Prob Set #1: Rates
Class 3	Sept. 6	Infectious Disease Epidemiology	Gordis: Ch.2 Article: Becker	
Class 4	Sept. 8	Direct & Indirect Standardization	Gordis: Ch. 4 (pp.74-82) Article: Harwell	
Class 5	Sept. 13	Data Sources & Secondary Analyses Guest: Seth Strope, MD	Gordis: None Article: Fiegelson	Prob Set #2: Standardization
Class 6	Sept. 15	Hypothesis Testing & Significance Guest: Siobhan Sutcliffe, PhD	Gordis: None Article: TBD	QUIZ #1
Class 7	Sept. 20	Bias, Confounding, & Effect Modification Guest: Kim Johnson, PhD	Gordis: Ch.15 Article: TBD	
Class 8	Sept. 22	Causation & Risk Guest: Amy Ostendorf	Gordis: Ch. 11, Ch.12, Ch.14 (230-245) Article: Hill	
Class 9	Sept. 27	Sampling Strategies & Descriptive Studies (Ecological, Cross Sectional, and Qualitative)	Gordis: Ch.10 (pp.195-198); Ch.14 (pp.228-230) Articles: Whitaker; Lacy	Prob Set #3: OR & RR
Class 10	Sept. 29	Case Control & Nested Case Control Studies	Gordis: Ch.10 Articles: Doll; Christensen	
Class 11	Oct. 4	Cohort Studies & CBPR Guest: Sarah Gehlert, PhD	Gordis: Ch.9 Article: Wilson	QUIZ #2
Class 12	Oct. 6	Intervention Studies	Gordis: Ch.7 & 8	Article critique
Class 13	Oct. 11	Screening Guest: Jean Wang, MD	Gordis: Ch.5 Articles: Mandelblatt; Kolata	
Class 14	Oct. 13	Part I: Environmental Epi Part II: Genetic & Molecular Epi Guest: Courtney Beers, MPH	Gordis: Ch.16 Articles: Wolff; McQuillan	Prob Set #4: Screening
Class 15	Oct. 18	Student Presentations		
Class 16	Oct. 20	Student Presentations		

*Full article citations are on p.5; additional readings to be assigned throughout the semester as needed.

Required Articles:

The following readings will supplement the text and should be completed prior to class. Students should be prepared to critically discuss articles from an epidemiologic perspective. All articles are accessible from WUSTL computers via three ways:

1. Click on the hyperlink in the syllabus from a WUSTL computer to directly access the article.
2. Search for the article on pubmed and click on the full-text link.
3. Access the journal via [Becker Library](#), and search the archives to directly access the article.

Class 1 (8/30): Morbidity & Mortality

1. Zhang Z, Saaddine JB, Chou CF, Cotch MF, Cheng YJ, et al. [Prevalence of Diabetic Retinopathy in the United States, 2005-2008](#). *JAMA*. 2010;304(6):649-656. PMID: 20699456.

Class 2 (9/1): Surveillance

2. Panozzo CA, Stockman LJ, Curns AT, and Anderson LJ. [Use of respiratory syncytial virus surveillance data to optimize the timing of immunoprophylaxis](#). *Pediatrics*. 2010 Jul;126(1):e116-23. Epub 2010 Jun 14. PMID: 20547651.
3. Bueno H, Ross JS, Wang Y, Chen J, Vidán MT, Normand ST, Curtis JP, et al. [Trends in Length of Stay and Short-term Outcomes Among Medicare Patients Hospitalized for Heart Failure, 1993-2006](#). *JAMA*. 2010;303(21):2141-2147. PMID: 20516414. (OPTIONAL)

Class 3 (9/6): Infectious Disease Epidemiology

4. Becker KM, Moe CL, Southwick KL, and MacCormack JN. [Transmission of Norwalk Virus During a Football Game](#). *NEJM*. 2000 Oct 26;343(17):1223-7. PMID: 11071673.

Class 4 (9/8): Standardization

5. Harwell TS et al. [Cancer Incidence in Montana: Rates for American Indians Exceed Those for Whites](#). *Am J Prev Med* 2006; 30(6):493-497. PMID: 16704943.

Class 5 (9/13): Data Sources & Secondary Analyses

6. Feigelson HS, Calle EE, Robertson AS, Wingo PA, Thun MJ. [Alcohol consumption increases the risk of fatal breast cancer \(United States\)](#). *Cancer Causes Control*. 2001 Dec;12(10):895-902. PMID: 11808708.

Class 8 (9/22): Cause & Risk

7. Hill AB. [The Environment and Disease: Association or Causation?](#) *Proc R Soc Med* 1965;58:295-300. PMCID: PMC1898525.

Class 9 (9/27): Descriptive Studies

8. Whitaker AK, Dude AM, Neustadt A, Gilliam ML. [Correlates of use of long-acting reversible methods of contraception among adolescent and young adult women](#). *Contraception*. 2010 Apr;81(4):299-303. Epub 2010 Feb 1. PMID: 20227545.
9. Lacy NL, Paulman, A, Reuter MD, Lovejoy B. [Why we don't come: patient perceptions on no-shows](#). *Ann Fam Med*. 2004 Nov-Dec;2(6):541-5. PMCID: PMC1466756.

Class 10 (9/29): Case Control Studies

10. Doll R and Hill AB. [Smoking and carcinoma of the lung](#). BMJ 1950; 2(4682):739-48.
11. Christensen HC, Schüz J, Kosteljanetz M, Poulsen HS, Thomsen J, and Johansen C. [Cellular telephone use and risk of acoustic neuroma](#). *Am J Epidemiology*. 2004;159(3):277-83. PMID: 14742288.

Class 11 (10/4): Cohort Studies

12. Wilson PW, Pencina M, Jacques P, Selhub J, D'Agostino R Sr, and O'Donnell CJ. [C-reactive protein and reclassification of cardiovascular risk in the Framingham Heart Study](#). *Circ Cardiovasc Qual Outcomes*. 2008 Nov;1(2):92-7. Epub 2008 Nov 9. PMCID: PMC3033831.

Class 13 (10/11): Screening

13. Kolata G. Panel Urges Mammograms at 50, not 40. New York Times. 16 Nov 2009. <http://www.nytimes.com/2009/11/17/health/17cancer.html>
14. Mandelblatt JS, Cronin KA, Bailey S, et al. [Effects of Mammography Screening Under Different Screening Schedules: Model Estimates of Potential Benefits and Harms](#). *Ann Intern Med* November 17, 2009 151:738-747. PMID: 19920274.

Class 14 (10/13): Environmental & Genetic/Molecular Epi

15. Wolff MS, Teitelbaum SL, Windham G, Pinney SM, Britton JA, Chelimo C, et al. [Pilot study of urinary biomarkers of phytoestrogens, phthalates, and phenols in girls](#). *Environ Health Perspect* 2007 Jan; 115(1):116-21. PMCID: PMC1797844.
16. McQuillan GM, Pan Q, and Porter KS. [Consent for genetic research in a general population: an update on the National Health and Nutrition Examination Survey experience](#). *Genet Med*. 2006 Jun;8(6):354-60. PMID: 16778597.